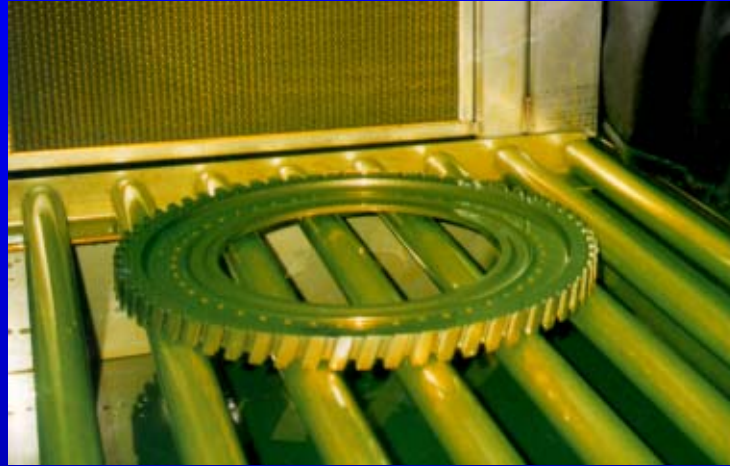


Relevant FPI Specifications



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Outline

- **US Military Standards**
- **ASTM Penetrant Standards**
- **SAE Aerospace Material Specifications**
- **Sources of Information**

US Military Standards

- **Mil-Std-6866 – Military Standard Inspection, Liquid Penetrant (Superceded by ASTM E1417, Nov 1996).**
- **Mil-Std-25135 and QPL – Inspection Materials, Penetrants (Superceded by AMS2644, March 1998).**
 - **Specifies the classification of penetrant systems, required properties of penetrant materials, and how the properties will be determined.**
 - **Has historically controlled the qualification of penetrant systems and classification into one of five performance sensitivity levels.**
 - **Testing done at Wright Laboratory.**

ASTM Penetrant Standards (American Standards for Testing and Materials)

E165	Standard Test Method for Liquid Penetrant Examination Provides an overview of the various penetrant inspection options and general processing guidelines for performing the inspections.
E1417	Standard Practice for Liquid Penetrant Examination Establishes the minimum requirements for performing penetrant inspections. Can be used as a replacement for Mil-Std-6866.
E433	Standard Reference Photographs for Liquid Penetrant Inspection Provides a collection of photographs that establishes types and characteristics of surface defects. The photographs may be used to establish flaw rejection criteria.
E1135	Standard Test Method for Comparing the Brightness of Fluorescent Penetrants Provides a procedure for measuring the brightness of penetrant materials. Used by penetrant manufactures to make comparisons of penetrant materials.

ASTM Standards are developed by a committee of interested parties from a variety of industries and are therefore fairly general.

ASTM Specifications Specific to a Penetrant Inspection Method

E1208	Standard Test Method for Fluorescent Liquid Penetrant – Examination Using the Lipophilic Post-Emulsification Process
E1209	Standard Test Method for Fluorescent Liquid Penetrant – Examination Using the Water-Washable Process
E1210	Standard Test Method for Fluorescent Liquid Penetrant – Examination Using the Hydrophilic Post –Emulsification
E1219	Standard Test Method for Fluorescent Liquid Penetrant – Examination Using the Solvent-Removable Process
E1220	Standard Test Method for Visible Liquid Penetrant – Examination Using the Solvent-Removable Process
E1418	Standard Test Method for Visible Penetrant Examination – Using the Water-Washable Process

Each specification provides a procedure for performing the particular inspection method.

SAE Aerospace Material Specifications

- **AMS Spec are developed by SAE Committee K members**
- **Committee K established at the request of ATA member airlines**
- **SAE Committee K documents are generated by aerospace industry members**
- **Meets twice yearly in conjunction with spring ASNT meeting and fall ATA NDT Forum**
- **Includes penetrant and magnetic particle working group to address issues identified by the industry**
- **Resulting documents are aerospace specific**

SAE Aerospace Material Specifications

- **AMS 2644 - Inspection Materials, Penetrant.**
 - Establishes the classification of penetrant systems, required properties of penetrant materials, and how the properties will be determined.
 - Supercedes Mil-Std-25135.
 - Wright Laboratories will continue to perform the qualification tests for the Qualified Products List (QPL).
 - Backup penetrant qualification capability developed at Sandia National Laboratory with FAA funding.
- **AMS 2647 - Fluorescent Penetrant Inspection, Aircraft and Engine Component Maintenance.**
 - Details the requirements and procedures for performing FPI on aircraft and engine components.
 - Supercedes Mil-Std-6866.

Where to Find Info on Specification

DOD Specifications and Standards

For info - ASSIST-Online at astimage.daps.dla.mil/online

To order documents – DOD Single Stock Point at www.dodssp.daps.mil

SAE Aerospace Material Specifications

For Information and to order

www.sae.org/servlets/techtrack?PROD_TYP=STD

ASTM Specifications

For Information and to order

www.astm.org

Summary of Penetrant Inspection Specifications

- **Mil-Std-6866 and Mil-Std-25135 have historically been used to control penetrant inspection practices and materials but are being phased-out.**
- **ASTM specifications are available but are relatively general to allow use by a large variety of industry.**
- **SAE AMS 2644 and 2647 are specifications that have been developed for use largely for the aerospace industry. (Mil-Std-2647 is specific to FPI of aircraft and engine components.)**